

The Examiner has rejected claims 28-30 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The Examiner states that claim 28 recites the limitation, "...wherein the plate portion is formed in a pre-loaded shape..." and that the scope of the claim is vague since it is not known what the term "pre-loaded shape" encompasses.

Applicant submits that claim 28 recites "a plate portion of flexible material coupled to the attachment portion, wherein the plate portion is formed in a pre-loaded shape so as to exert pressure to the at least one die...." Referring to page 20, lines 17-23, applicant submits that a plate portion is described wherein such pressure is exerted, and it is stated that the plate portion "may be constructed of a deformable material that deforms under the pressure applied by the integrated circuits." Thus, a pre-loaded shape may be readily understood to be a shape "in a relaxed state" that is different from a shape that results when the pressure plate of a deformable material deforms under the pressure against the at least one die. An example is provided wherein "the curvature of arcuate portion 2169 may change when the integrated circuit cover is installed, even to the extent that the arcuate portion 2169 becomes flat or curved in an opposite direction. Thus, applicant submits that, in the context of the specification, the meaning of a "pre-loaded shape" can be understood. Therefore, applicant submits that claims 28-30 are in condition for allowance.

The Examiner has rejected claims 1, 16-19, 31-32, and 36-40 under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 5,783,461 to Hembree. Regarding claim 1, the Examiner states that Hembree teaches an IC cover (Figs. 1 & 2) comprising:

a plate portion (24);

an attachment portion (under spring portion (22)); and

a spring portion coupled to the plate.

Applicant respectfully disagrees. Applicant submits that Hembree does not disclose the claimed integrated circuit (IC) cover as set forth in claim 1. Applicant notes that Hembree, in col. 3, lines 40-41, states that "[t]he force applying mechanism 18 includes a pressure plate 20, a spring 22, and a cover 24." Applicant can find nothing in Hembree that would suggest that cover 24 comprises the elements recited in claim 1. Moreover, Applicant submits that the Examiner has misidentified cover 24 and the supposed attachment portion, which applicant presumes to refer to pressure plate 20,

no, pre-loaded could be taken to mean that the shape is "loaded" with some weight or pressure. yet this is still not relevant with respect to shape vs a structure.

based on the Examiner's reference to something "(under spring portion (22))." While Hembree clearly identifies cover 24 as being a cover and pressure plate 20 as being a plate, the Examiner instead alleges that cover 24 is a plate portion and that what is presumed to be pressure plate 20 is an attachment portion. Notwithstanding that the terms used in Hembree may have different meanings than similar terms appearing in the present application, Applicant submits that the Examiner has not presented evidence to overcome Hembree's explicit use of certain terms in a manner different from the associations that the Examiner ascribes to the elements of Hembree bearing those terms. Thus, Applicant submits that Hembree fails to disclose the claimed invention as set forth in claim 1. Therefore, Applicant submits that claim 1 is in condition for allowance.

Regarding claim 16, the Examiner states that Hembree teaches an IC cover, wherein the spring portion includes a plurality of individual spring elements, wherein a first one of the plurality of individual spring elements is disposed at a first end of the plate portion and a second one of the plurality of individual spring elements is disposed at a second end of the plate portion.

Applicant respectfully disagrees. Applicant submits that Hembree fails to disclose the invention as recited in claim 16. Applicant notes that Hembree refers only to a singular spring 22, and applicant cannot find any evidence that would suggest that spring 22 includes a plurality of individual spring elements, wherein a first one is disposed at a first end of the plate portion and a second one is disposed at a second end of the plate portion. Thus, applicant submits that Hembree fails to disclose the claimed invention as set forth in claim 16. Therefore, applicant submits that claim 16 is in condition for allowance.

Regarding claims 17 and 19, the Examiner states that Hembree teaches an IC cover, wherein the spring elements are disposed around a perimeter of the plate portion.

Applicant respectfully disagrees. Regarding claim 17, applicant reiterates the argument with respect to claim 16 above that Hembree refers only to a singular spring 22, and applicant cannot find any evidence that would suggest that spring 22 includes a plurality of individual spring elements, wherein a first one is disposed at a first end of the plate portion and a second one is disposed at a second end of the plate portion. Moreover, applicant cannot find any evidence in Hembree that would suggest that a plurality of individual spring elements are disposed around a perimeter of a plate portion. Regarding claim 19, applicant reiterates the argument with respect to claim 1 above that Hembree fails to disclose the invention as set forth in claim 1, from which claim 19 depends. Thus,

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applicant submits that Hembree fails to disclose the claimed invention as set forth in claims 17 and 19. Therefore, applicant submits that claims 17 and 19 are in condition for allowance.

Regarding claim 18, the Examiner states that Hembree teaches an IC cover, wherein at least one of the spring elements is maintained in a non-relaxed state.

Applicant respectfully disagrees. Applicant reiterates the argument with respect to claim 16 above that Hembree refers only to a singular spring 22, and applicant cannot find any evidence that would suggest that spring 22 includes a plurality of individual spring elements, wherein a first one is disposed at a first end of the plate portion and a second one is disposed at a second end of the plate portion. Thus, applicant submits that Hembree fails to disclose the claimed invention as set forth in claim 18. Therefore, applicant submits that claim 18 is in condition for allowance.

Regarding claim 31, the Examiner states that Hembree teaches an IC assembly (Fig. 2) comprising:

- a circuit board (16);

- a first die (12) disposed on a first surface of the circuit board; and

- a cover including:

 - a plate portion (24) disposed so as to cover the first die;

 - an attachment portion (directly under spring (22)) attached to the circuit board; and

 - a spring portion (22) coupled to the plate portion and the attachment portion.

Applicant respectfully disagrees. Applicant submits that Hembree fails to disclose the invention as set forth in claim 31. For example, Hembree fails to disclose an attachment portion attached to the circuit board and a spring portion coupled to the plate portion and to the attachment portion. While the Examiner asserts that something "(directly under spring (22))" constitutes an attachment portion, nothing "directly under spring (22)" appears to be attached to a circuit board. Moreover, applicant submits that the misidentification described with respect to claim 1 also appears to contradict the alleged applicability of the Hembree reference to the features of the present invention as set forth in claim 31. Thus, applicant submits that claim 31 is in condition for allowance.

Regarding claim 32, the Examiner states that Hembree teaches an assembly, wherein the spring portion exerts pressure between the plate portion and the first die.

Applicant respectfully disagrees. Applicant submits that Hembree cannot teach an IC assembly wherein the spring portion exerts pressure between the plate portion and the at least one first die, as Hembree fails to disclose an attachment portion attached to the circuit board and a spring portion coupled to the plate portion and to the attachment portion. Thus, applicant submits that claim 32 is in condition for allowance.

Regarding claim 36, the Examiner states that Hembree teaches an IC cover comprising:

a plate portion (24) having a plurality of edges;

a plurality of attachment portions (located under spring (22)); and

a plurality of spring portions coupled to the plate portion and attachment portions, wherein the springs are oriented along a direction corresponding to the plurality of edges.

Applicant respectfully disagrees. Applicant notes that the Examiner has vaguely attempted to characterized a supposed plurality of attachment portions of Hembree as being “(located under spring (22)).” Likewise, Applicant notes that the Examiner appears to regard cover 24 of Hembree as a plate portion having a plurality of edges. Moreover, while Hembree mentions only a single spring 22, the Examiner appears to mischaracterize spring 22 as a plurality of spring portions coupled to the plate portion and to the plurality of attachment portions, wherein each of the spring portions is oriented along a direction of a corresponding one of the plurality of edges. Applicant submits that, not only does Hembree fail to disclose a plurality of spring portions and a plurality of attachment portions, wherein the plurality of spring portions are coupled to the plurality of attachment portions, but Hembree also fails to disclose a plurality of spring portions wherein each of the spring portions is oriented along a direction of a corresponding one of the plurality of edges. Thus, applicant submits that claim 36 is in condition for allowance.

Regarding claim 37, the Examiner states that Hembree teaches an IC cover, wherein center lines of the springs are oriented so as to be non-radial relative to a centroid of the plate portion.

Applicant respectfully disagrees. Applicant notes that the Examiner offers no explanation or reasons to support his conclusion. Moreover, applicant submits that Hembree fails to disclose anything

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even remotely related to “center lines,” “non-radial,” or “a centroid,” for example. Thus, applicant submits that Hembree cannot possibly disclose the subject matter of claim 37. Therefore, applicant submits that claim 37 is in condition for allowance.

Regarding claim 38, the Examiner states that Hembree teaches an IC cover, wherein each of the center lines of the spring portions are oriented approximately tangentially in relation to a corresponding one of the plurality of edges.

Applicant respectfully disagrees. Applicant notes that the Examiner offers no explanation or reasons to support his conclusion. Moreover, applicant submits that Hembree fails to disclose anything even remotely related to “center lines” or “tangentially,” for example. Thus, applicant submits that Hembree cannot possibly disclose the subject matter of claim 38. Therefore, applicant submits that claim 38 is in condition for allowance.

Regarding claim 39, the Examiner states that Hembree teaches an IC cover, wherein the spring portions are oriented in a similar rotational direction with respect to a centroid of the plate portion.

Applicant respectfully disagrees. Applicant notes that the Examiner offers no explanation or reasons to support his conclusion. Moreover, applicant submits that Hembree fails to disclose anything even remotely related to “a similar rotational direction” or “a centroid,” for example. Thus, applicant submits that Hembree cannot possibly disclose the subject matter of claim 39. Therefore, applicant submits that claim 39 is in condition for allowance.

Regarding claim 40, the Examiner states that Hembree teaches an IC cover, wherein the plurality of spring portions are configured to cooperatively accommodate displacement of the plate portion from a relaxed position.

Applicant respectfully disagrees. Applicant notes that Hembree fails to disclose the plurality of spring portions and the plurality of attachment portions. Moreover, nothing “(located under spring (22)),” which the Examiner has attempted to characterize as being a plurality of attachment portions, appears to be coupled to a circuit board. Therefore, applicant submits that claim 40 is in condition for allowance.

The Examiner has rejected claims 2-6, 15, and 26 under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of U.S. Patent Application Publication

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No. U.S. 2002/0079571, Application No. 09/379,537 to Takeuchi, et al. Regarding to claims 2 and 26, the Examiner states that Hembree does not teach an IC cover that is unitarily molded of a polymer material. The Examiner further states that Takeuchi et al. teach an IC cover that is unitarily molded of a polymer material (section [0020] third and fifth sentence). The Examiner further states that it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi, et al. into the device taught by Hembree, since the polymer material is a known material that is well suited for the intended use. The Examiner continues by stating that the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). The Examiner also states that Hembree does not explicitly teach that the spring portion is a polymer material, but that Hembree teaches that the spring portion can be formed of an elastomeric material, and concludes that it would have been obvious to select a polymer material since it is a known material that is well suited for the intended use.

Applicant respectfully disagrees. Applicant submits that neither Hembree nor Takeuchi, et al., taken alone or in combination, disclose or suggest either an IC cover unitarily molded of a polymer material or an IC cover wherein the attachment portion and the spring portion are unitarily molded of a polymer material. Applicant submits that, while Takeuchi, et al. state, "In one embodiment, spring clip 227 is fabricated as an integral part of retention frame 224," Takeuchi, et al. fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion, wherein the IC cover is unitarily molded of a polymer material. For example, Takeuchi, et al. illustrate retention frame attachment feature 230 as a separate element, such as a screw, pin, or clip, not as part of an IC cover unitarily molded of a polymer material. Likewise, Takeuchi, et al. fail to disclose or suggest an attachment portion and a spring portion that are unitarily molded of a polymer material. Thus, applicant submits that claims 2 and 26 are in condition for allowance.

Regarding claim 3, the Examiner states that neither Hembree nor Takeuchi, et al. teach an IC cover wherein the polymer material has a thermal conductivity of at least 10 watts/meter Kelvin. The Examiner asserts that Takeuchi, et al. teach that it is desirable to remove excess heat from integrated circuits, as is known in the art and concludes that it would have been obvious to one of ordinary skill in the art to provide a polymer material having good thermal conductivity, since it is desirable to remove heat from the IC.

Applicant respectfully disagrees. Applicant submits that Takeuchi, et al. teaches away from an IC cover unitarily molded of a polymer material having a thermal conductivity of at least 10 watts/meter Kelvin. Rather, Takeuchi, et al. disclose a separate slug 215 "fabricated from a material having high thermal conductivity, such as copper or copper alloy" (column 1, paragraph [0015], first sentence). The reliance of Takeuchi, et al. on that separate slug for high thermal conductivity teaches away from an IC cover comprising a plate portion, an attachment portion, and a spring portion unitarily molded of a polymer material having a thermal conductivity of at least 10 watts/meter Kelvin. Rather, Takeuchi, et al. describes retention frame 224 (which the Examiner characterizes as being a plate portion), as capping and protecting substrate 218 and electronic chip 209 from physical damage and being fabricated from a material that is inexpensive and easily shaped, such as plastic, steel, or stainless steel (column 2, paragraph [0019], first three sentences). Applicant notes that, in the prior art, and presumably in Takeuchi, et al., materials such as plastic, steel, and stainless steel typically have lower thermal conductivity than copper or copper alloy, which applicant considers to be a further indication that Takeuchi, et al. teaches away from the claimed invention as recited in claim 3. Thus, applicant submits that claim 3 is in condition for allowance.

Regarding claim 4, the Examiner states that Hembree does not teach an IC cover, further comprising a heat sink coupled to the plate. The Examiner further states that Takeuchi et al. teaches an IC wherein a heat sink is coupled to the plate and concludes that it would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Takeuchi, et al. into the device taught by Hembree, since it is desirable to remove excess heat from the IC.

Applicant respectfully disagrees. Applicant submits that Hembree and Takeuchi, et al., either alone or in combination, fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion coupled to the plate portion and to the attachment portion. Also, as noted above, applicant submits that Takeuchi, et al. fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion, wherein the IC cover is unitarily molded of a polymer material. For example, Takeuchi, et al. illustrate retention frame attachment feature 230 as a separate element, such as a screw, pin, or clip, not as part of an IC cover unitarily molded of a polymer material. Thus, applicant submits that claim 4 is in condition for allowance.

Regarding claim 5, the Examiner states that Hembree does not teach an IC cover wherein the heat sink portion includes extended surfaces. The Examiner further states that Takeuchi, et al. teach an

IC cover, wherein the heat sink includes extended surfaces and concludes that it would have been obvious to one of ordinary skill in the art to incorporate the teaching of Takeuchi, et al. into the device taught by Hembree for reasons cited above.

Applicant respectfully disagrees. Applicant submits that Hembree and Takeuchi, et al., either alone or in combination, fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion coupled to the plate portion and to the attachment portion. Also, as noted above, applicant submits that Takeuchi, et al. fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion, wherein the IC cover is unitarily molded of a polymer material. For example, Takeuchi, et al. illustrate retention frame attachment feature 230 as a separate element, such as a screw, pin, or clip, not as part of an IC cover unitarily molded of a polymer material. Thus, applicant submits that claim 5 is in condition for allowance.

Regarding claim 15, the Examiner states that Hembree teaches an IC cover wherein the spring portion is disposed at an end of the plate portion.

Applicant respectfully disagrees. Applicant notes that the Examiner offers no explanation or reasons to support his conclusion. Applicant submits that Takeuchi, et al. fail to disclose or suggest the claimed invention as set forth in claim 15. For example, Takeuchi, et al. fail to disclose or suggest a spring portion coupled to the plate portion and to the attachment portion. Thus, applicant submits that claim 15 is in condition for allowance.

The Examiner has rejected claims 6 under 35 U.S.C. 103(a) as being unpatentable over Hembree and Takeuchi, et al. as applied to claim 5 above, and further in view of U.S. Patent No. 6,349,032 to Chan et al. The Examiner states that Hembree and Takeuchi et al. do not teach a device, wherein the heat sink portion includes fins. The Examiner further states that Chan et al. teach an IC wherein the heat sink portion includes fins (Fig. 1 (14)). The Examiner concludes that it would have been obvious to one of ordinary skill in the art to incorporate the heat sink with fins into the device taught by Hembree and Takeuchi, et al. since it is a well known heat sink structure and it is desirable to provide a means for efficient removal of excess heat from the IC.

Applicant respectfully disagrees. Applicant submits that Hembree, Takeuchi, et al. and Chan, et al., either alone or in combination, fail to disclose or suggest the claimed invention as set forth in claim 6. As an example, Applicant submits that Hembree, Takeuchi, et al., and Chan, et al., either

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alone or in combination, fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion coupled to the plate portion and to the attachment portion. As another example, Hembree, Takeuchi, et al., and Chan, et al. fail to disclose or suggest an IC cover unitarily molded of a polymer material. Therefore, applicant submits that claim 6 is in condition for allowance.

The Examiner has rejected claims 22-24 under 35 U.S.C. 103(a) as being unpatentable over Hembree as applied to claim 1 above, and further in view of Chan, et al. The Examiner states that Hembree does not teach an IC cover including a heat sink with extended surfaces comprising fins. The Examiner further states that Chan, et al. teaches an IC including a heat sink with extended surfaces comprising fins and concludes that it would have been obvious to one of ordinary skill in the art to incorporate the heat sink taught by Chan, et al. into the IC taught by Hembree, since it is desirable to remove excess heat from the IC.

Applicant respectfully disagrees. Applicant submits that Hembree, Takeuchi, et al. and Chan, et al., either alone or in combination, fail to disclose or suggest the claimed invention as set forth in claims 22-24. As an example, Applicant submits that Hembree, Takeuchi, et al., and Chan, et al., either alone or in combination, fail to disclose or suggest an IC cover comprising a plate portion, an attachment portion, and a spring portion coupled to the plate portion and to the attachment portion. Therefore, applicant submits that claims 22-24 are in condition for allowance.

The Examiner has objected to claim 14 as being dependent upon a rejected base claim, but states that it would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant submits that the base claims and any intervening claims are in condition for allowance, for the reasons set forth above. Therefore, Applicant submits that claims 14 and 33 are in condition for allowance.

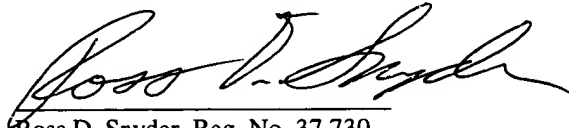
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In conclusion, Applicant has overcome all of the Office's rejections, and early notice of allowance to this effect is earnestly solicited. If, for any reason, the Office is unable to allow the Application on the next Office Action, and believes a telephone interview would be helpful, the Examiner is respectfully requested to contact the undersigned attorney.

Respectfully submitted,

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Date



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